

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

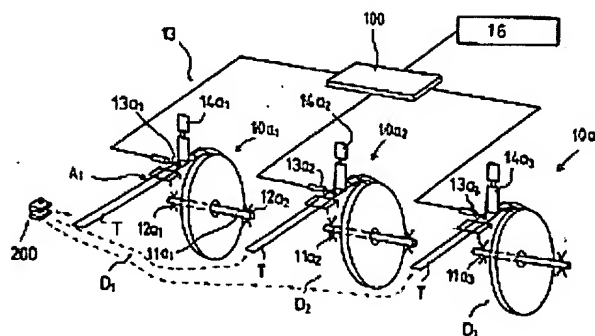
IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

Patent number: EP1078127
Publication date: 2001-02-28
Inventor: ESKELINEN ILKKA (FI); TOIVANEN HEIKKI (FI)
Applicant: VALMET CORP (FI)
Classification:
- international: D21G3/00; B65H49/00
- european:
Application number: EP19990906286 19990302
Priority number(s): WO1999FI00159 19990302; FI19980000514 19980306

WO9945197 (A1)
FI980514 (A)
EP1078127 (B1)
FI111865B (B)

The invention concerns an equipment and a method in handling of doctor blades for a paper/board machine. The doctor blade (T) will be placed against the face of a roll in the paper/board machine so as to keep said face clean and to service said face. A doctor blade blank (T) is taken from a doctor blade roll (10a1, 10a2, 10a3 ...), i.e. from a reel. The equipment comprises a cut-off device (14a1, 14a2 ...) for cutting off the doctor blade material to the desired pull-out or blade length.



06/02/2004

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 078 127 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

18.02.2004 · Bulletin 2004/08

(21) Application number: 99906286.2

(22) Date of filing: 02.03.1999

(51) Int Cl.7: D21G 3/00, B65H 49/00

(86) International application number:
PCT/FI1999/000159

(87) International publication number:
WO 1999/045197 (10.09.1999 Gazette 1999/36)

(54) EQUIPMENT AND METHOD IN HANDLING OF DOCTOR BLADES FOR A ROLL IN A
PAPER/BOARD MACHINE

VORRICHTUNG UND VERFAHREN BEI DER HANDHABUNG VON SCHÄBERKLINGEN FÜR
ROLLEN IN EINER PAPIER/PAPPENMASCHINE

EQUIPEMENT ET PROCEDE DE MANIPULATION DE LAMES DE RACLOIR POUR ROULEAU
DANS UNE MACHINE A PAPIER/CARTON

(84) Designated Contracting States:
AT DE FR GB IT SE

(30) Priority: 06.03.1998 FI 980514

(43) Date of publication of application:
28.02.2001 Bulletin 2001/09

(73) Proprietor: Metso Paper, Inc.
00130 Helsinki (FI)

(72) Inventors:
• TOIVANEN, Heikki
40640 Jyväskylä (FI)

• Eskelinen, Ilkka
40420 Jyska (FI)

(74) Representative:
Pellmann, Hans-Bernd, Dipl.-Ing. et al
Patentanwaltsbüro
Tiedtke-Bühling-Kinne & Partner
Bavariaring 4-6
80336 München (DE)

(56) References cited:
GB-A- 759 531 US-A- 3 318 443
US-A- 3 810 588

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 1 078 127 B1

Description

[0001] The invention concerns an equipment and a method in handling of doctor blades for a roll in a paper/board machine.

[0002] From the prior art, the use of various doctor blades is known. A doctor blade is an important part which secures the operation of a paper/board machine, which blade, fitted in connection with a roll, maintains the condition of the roll face and permits the passing of a web portion that is to be passed into the pulper out of connection with the roll. As is well known, doctor blades have been stored in connection with the paper/board machine on various shelves for doctor blades, from which shelves the doctor blade has been lifted straight into the doctor blade holder construction.

[0003] Document US-A-3 810 588 discloses an equipment in handling of doctor blades for a paper/board machine. According to this document, the doctor blade will be placed against the face of a roll in the paper/board machine so as to keep said face clean and to service said face. Further, a doctor blade blank can be taken from a doctor blade roll and can be cut-off to the desired pull-out or blade length by a cut-off device.

[0004] The object of the invention is to provide an equipment in handling of doctor blades for a paper/board machine and a method for handling said doctor blades which ensure that a doctor blade taken from a roll can be used having exactly the desired pull-out or blade length.

[0005] This object is solved by the features of claims 1 and 8.

[0006] In accordance with the invention, a separate storage carriage is employed, which comprises at least one roll of doctor blades from which the doctor blade can be unwound. In accordance with the invention, the doctor blade material placed on the roll can be unwound through a separate measurement device and through a cut-off device. The cut-off device comprises a measurement device in its connection, from which measurement device the pulled-out length of the doctor blade and the residual length remaining in the roll can be read. At the desired point, the feed of the doctor blade from the roll is stopped, and the doctor blade is cut off to the desired length. The roll of doctor blades has been fitted around a shaft, which has been mounted revolving, and the band of doctor blades is passed through separate guides to the cut-off device, and a measurement detector of the measurement device is placed in direct vicinity of the cut-off device, which measurement detector measures the blade length that has been fed. From a display placed in connection with a central unit, it is possible to read the blade length that has been fed out, and further, from the display it is possible to read the blade length that remains on the roll of doctor blades.

[0007] The roll of doctor blades is placed in a separate carriage, which can be shifted into different locations in connection with the paper/board machine. Thus, the

same carriage can be used in different locations while the carriage comprises a number of different rolls of doctor blades and separate cut-off means and measurement detectors for said rolls of doctor blades.

[0008] The method and the equipment in accordance with the invention are characterized in what is stated in the patent claims.

[0009] The invention will be described in the following with reference to some preferred embodiments of the invention illustrated in the figures in the accompanying drawings, the invention being, yet, not supposed to be confined to said embodiments alone.

[0010] Figure 1 is an axonometric view of a storage carriage for rolls of doctor blades, which carriage comprises, in accordance with the invention, separate positions for different reels of doctor blades or rolls of doctor blades as well as, for each roll, separate cut-off devices and measurement detectors for the device for measurement of the length of the doctor blade. The cut-off doctor blade blank is provided with perforations and fastenings and is, after that, installed in connection with a roll in the paper/board machine.

[0011] Figure 2 is a schematic illustration of a roll of doctor blades, i.e. a reel of doctor blades 10a₁, 10a₂, 10a₃, in accordance with the invention, wherein the blank of a doctor blade has been mounted on a shaft, which is provided with bearings, and wherein, in the vicinity of the feed-out end of the doctor blade, there is a detector of the measurement device and a cut-off device. Further, in the vicinity of the feed-out opening, there is a guide for the doctor blade. A doctor blade placed on the roll can also be called a doctor blade blank, because a doctor blade blank that has been cut off to the specified measure is provided with perforations and required fastenings.

[0012] Figure 3 is a schematic illustration of the operation of an equipment in accordance with the invention as a block diagram presentation.

[0013] Fig. 1 is an axonometric illustration of a storage carriage 50 for rolls of doctor blades 10a₁, 10a₂, 10a₃, which carriage comprises a frame R and an upper openable lid R₁ and a side cover R₂. The rolls of doctor blades 10a₁, 10a₂ and 10a₃ are placed in compartments D₁, D₂ and D₃ inside the frame R. Each roll or reel of doctor blades 10a₁, 10a₂, 10a₃ has been mounted revolving on its shaft 11 by means of bearings 12a₁, 12a₂. For example, in connection with the feed-out opening A₁ of the compartment D₁ of the doctor blade roll 10a₁, there is the measurement detector 13a₁ of the device 13 for measurement of the length of the doctor blade T as well as the cut-off device 14a₁ and at least one guide 15a₁, 15a₂, Based on the measurement signal produced by means of the measurement detector 13a₁, the feed-out length of the doctor blade T that has been fed out and also the residual length remaining on the roll 10a₁ are computed in the central unit 100, and said measurement data can be read from the display 16. When the desired/estimated feed-out length of the doctor blade T has been

reached, the cut-off device 14 is operated and the doctor blade T is cut off. In a corresponding way, the similar stations D₂ and D₃ comprise similar arrangements of equipment for the doctor blade rolls 10a₂, 10a₃ connected with the stations. The feed-out length can also be estimated, in which case no measurement device is used.

[0014] Fig. 2 is a schematic illustration of an equipment in accordance with the invention, which equipment comprises doctor blade roll stations D₁, D₂, D₃, of which stations each station D₁, D₂, D₃ is provided with a shaft 11a₁, 11a₂, 11a₃ of its own for a roll of doctor blades 10a₁, 10a₂, 10a₃, bearings 12a₁, 12a₂ mounted on the shaft 11a₁, 11a₂, 11a₃, and further a feed-out opening A₁, A₂, A₃ and in its connection measurement detectors 13a₁, 13a₂, 13a₃ for the measurement equipment 13, as well as a display 16 for the display of the measurement information produced from each station D₁, D₂, D₃. The central unit 100 operates as a collector/processor of the data and feeds out the measurement data along the bus e₄ to the display 16, which measurement data have been obtained based on the information produced by the measurement detectors 13a₁, 13a₂, 13a₃. The cut-off device 14a₁, 14a₂ and 14a₃ of each station D₁, D₂, D₃ can carry out the cutting-off of the doctor blade T based on the data read from the display 16. The cutting-off can be carried out by the operator of the carriage 50. In addition to the cut-off device, the equipment in accordance with the invention can also include a perforation device 200, by whose means pull-out holes can be perforated to the end/ends of the doctor blade. The perforation device can be fitted in connection with the cut-off device, or it can be a separate device which is independent from the cut-off device and which can be displaced to the desired position D₁, D₂, D₃.

[0015] Further, the central unit 100 can include controls for the operation of the cut-off device 14a₁, 14a₂, 14a₃, for example in connection with the lid R₁ of the carriage 50. Similarly, the display 16 can be placed in connection with the lid R₁.

[0016] Fig. 3 is a block diagram presentation of the operation of the device in accordance with the invention. From the measurement detectors 13a₁, 13a₂ or 13a₃ of the stations D₁, D₂, D₃ the measurement information n is passed along the data transfer buses e₁, e₂, e₃ to the central unit 100, and further from the central unit 100 there is a data transfer bus e₄ to the display 16 for reading of the information of the station D₁ and/or D₂ and/or D₃. Optionally it is possible to read the length of the blade T that has been pulled out of the opening A₁ or A₂ or A₃, in which case the cut-off device 14a₁ and/or 14a₂ and/or 14a₃ can be operated when the desired pull-out length has been reached. From the display 16 it is also possible to read, in respect of each station D₁ or D₂ or D₃, the remaining blade length of the doctor blade roll 10a₁ or 10a₂ or 10a₃ placed in the respective station. The guide 15a₁, 15a₁'...; 15a₂, 15a₂'...; 15a₃, 15a₃'... controls the blade T in a controlled way past the meas-

urement detector 13a₁, 13a₂, 13a₃ of each station D₁, D₂, D₃ and further past the cut-off device 14a₁, 14a₂, 14a₃ related to the station D₁, D₂, D₃....

Claims

1. An equipment in handling of doctor blades for a paper/board machine, which doctor blade (T) will be placed against the face of a roll in the paper/board machine so as to keep said face clean and to service said face, wherein a doctor blade blank (T) is taken from a doctor blade roll (10a₁, 10a₂, 10a₃...), i.e. from a reel, and that the equipment comprises a cut-off device (14a₁, 14a₂...) for cutting off the doctor blade material to the desired pull-out or blade length, characterized in that the equipment comprises a measurement device (13), and the pull-out length can be read on the basis of the information transferred by the measurement detector (13a₁, 13a₂, 13a₃...) of said measurement device (13) to the central unit (100) in order to cut-off the desired length of a doctor blade.
2. An equipment as claimed in claim 1, characterized in that the equipment comprises a display (16) in connection with the central unit (100), from which display it is possible to read the length pulled out from a doctor blade roll (10a₁, 10a₂, 10a₃...), based on the information transmitted by a measurement detector (13a₁, 13a₂, 13a₃...) of the measurement device (13), so as to determine the correct cut-off point.
3. An equipment as claimed in any of the preceding claims, characterized in that the measurement detector (13a₁, 13a₂, 13a₃...) and the cut-off device (14a₁, 14a₂...) are placed in the vicinity of the blade (T) feed-out opening (A₁, A₂...) of the doctor blade roll station (D₁, D₂, D₃...), and that the doctor blade blank (T) can be controlled by means of a guide (15a₁, 15a₁'; 15a₂, 15a₂'...) in a controlled way out of the doctor blade roll station (D₁, D₂, D₃...).
4. An equipment as claimed in any of the preceding claims, characterized in that the doctor blade rolls (10a₁, 10a₂, 10a₃...) have been fitted on shafts (11a₁, 11a₂, 11a₃) of their own, which have been mounted by means of bearings (12a₁, 12a₂...).
5. An equipment as claimed in any of the preceding claims, characterized in that the central unit (100) is connected with a data transfer bus (e₁, e₂, e₃) passing from the measurement detector (13a₁, 13a₂, 13a₃...) of the measurement device (13), and that there is a data transfer bus (e₄) from the central unit (100) to the display (16).

6. An equipment as claimed in any of the preceding claims, **characterized in that** the doctor blade rolls (10a₁, 10a₂, 10a₃) in each doctor blade roll station (D₁, D₂, D₃) are placed in a storage carriage (50), which storage carriage (50) comprises wheels (50a₁, 50a₂, 50a₃, 50a₄) for moving the storage carriage (50), in which case the storage carriage can be shifted readily to the desired location in connection with the paper/board machine.
7. An equipment as claimed in claim 1, **characterized in that** the equipment further comprises a perforation device (200) for perforation of pull-out holes to the end/ends of the doctor blade.
8. A method in handling of doctor blades for a paper/board machine, which doctor blades are meant to be used in connection with rolls of a paper/board machine for servicing of their roll faces, wherein a doctor blade blank is guided from a doctor blade roll (10a₁, 10a₂, 10a₃...) to a cut-off device (14a₁, 14a₂, 14a₃), **characterized in that** there is a measurement device (13) and therein a measurement detector (13a₁, 13a₂, 13a₃), and the length of the doctor blade pulled out from the doctor blade roll can be read based on the information transmitted by said detector in order to determine the correct cut-off point of the doctor blade (T), and that by means of the cut-off device (14a₁, 14a₂, 14a₃) the doctor blade (T) that has been pulled out is cut off to the desired cut-off length.

Patentansprüche

1. Anlage zum Handhaben von Schaberklingen für eine Papiermaschine / Kartonmaschine, wobei die Schaberklinge (T) an der Seite einer Walze bei einer Papiermaschine / Kartonmaschine so angeordnet ist, dass diese Seite sauber gehalten wird und diese Seite gewartet wird, wobei ein Schaberklingenrohling (T) von einer Schaberklingenrolle (10a₁, 10a₂, 10a₃...) das heißt von einer Aufrollung genommen wird, und wobei die Anlage eine Abtrennvorrichtung (14a₁, 14a₂...) aufweist, um das Schaberklingenmaterial auf die erwünschte Herausziehlänge oder Klingenslänge abzutrennen, **dadurch gekennzeichnet, dass** die Anlage eine Messvorrichtung (13) aufweist und die Herausziehlänge auf der Grundlage der Information, die durch die Messerfassungseinrichtung (13a₁, 13a₂, 13a₃...) der Messvorrichtung (13) zu der Zentraleinheit (100) übertragen wird, gelesen werden kann, um die erwünschte Länge einer Schaberklinge abzutrennen.
2. Anlage gemäß Anspruch 1,

dadurch gekennzeichnet, dass

die Anlage eine Anzeige (16) in Verbindung mit der Zentraleinheit (100) aufweist, wobei es auf der Grundlage der Information, die durch eine Messerfassungseinrichtung (13a₁, 13a₂, 13a₃...) der Messvorrichtung (13) übertragen wird, möglich ist, von der Anzeige die Länge zu lesen, die von einer Schaberklingenrolle (10a₁, 10a₂, 10a₃...) herausgezogen wird, um so den korrekten Abtrennpunkt zu bestimmen.

3. Anlage gemäß einem der vorherigen Ansprüche, **dadurch gekennzeichnet, dass** die Messerfassungseinrichtung (13a₁, 13a₂, 13a₃...) und die Abtrennvorrichtung (14a₁, 14a₂...) in der Nähe der Herausführöffnung (A₁, A₂...) für die Klinge (T) der Schaberklingenrollenstation (D₁, D₂, D₃...) angeordnet sind und der Schaberklingenrohling (T) mittels einer Führung (15a₁, 15a₂, 15a₃...) in einer gesteuerten Weise aus der Schaberklingenrollenstation (D₁, D₂, D₃...) gesteuert werden kann.
4. Anlage gemäß einem der vorherigen Ansprüche, **dadurch gekennzeichnet, dass** die Schaberklingenrollen (10a₁, 10a₂, 10a₃...) an ihren eigenen Wellen (11a₁, 11a₂, 11a₃) sitzen, die mittels Lager (12a₁, 12a₂...) montiert sind.
5. Anlage gemäß einem der vorherigen Ansprüche, **dadurch gekennzeichnet, dass** die Zentraleinheit (100) mit einem Datenübertragungsbus (e₁, e₂, e₃) verbunden ist, der von der Messerfassungseinrichtung (13a₁, 13a₂, 13a₃...) der Messvorrichtung (13) tritt, und ein Datenübertragungsbus (e₄) von der Zentraleinheit (100) zu der Anzeige (16) vorhanden ist.
6. Anlage gemäß einem der vorherigen Ansprüche, **dadurch gekennzeichnet, dass** die Schaberklingenrollen (10a₁, 10a₂, 10a₃) in jeder Schaberklingenrollenstation (D₁, D₂, D₃) in einem Speicherschlitten (50) angeordnet sind, wobei der Speicherschlitten (50) Räder (50a₁, 50a₂, 50a₃, 50a₄) aufweist, um den Speicherschlitten (50) zu bewegen, wobei in diesem Fall der Speicherschlitten ohne weiteres zu dem erwünschten Ort in Verbindung mit der Papiermaschine / Kartonmaschine verschoben werden kann.
7. Anlage gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die Anlage des weiteren eine Perforationsvorrichtung (200) für eine Perforation von Herausziehlöchern an dem Ende / den Enden der Schaberklinge aufweist.

8. Verfahren beim Handhaben von Schaberklingen für eine Papiermaschine / Kartonmaschine, wobei die Schaberklingen in Verbindung mit Walzen einer Papiermaschine / Kartonmaschine verwendet werden sollen, um deren Walzenflächen zu warten, wobei ein Schaberklingenrohling von einer Schaberklingenrolle (10a₁, 10a₂, 10a₃,...) zu einer Abtrennvorrichtung (14a₁, 14a₂, 14a₃) geführt wird, **dadurch gekennzeichnet, dass**

eine Messvorrichtung (13) und in ihr eine Messerfassungseinrichtung (13a₁, 13a₂, 13a₃) vorhanden ist, und wobei die Länge der von der Schaberklingenrolle herausgezogenen Schaberklinge auf der Grundlage der Information, die durch die Erfassungseinrichtung übertragen wird, gelesen werden kann, um den korrekten Abtrennpunkt der Schaberklinge (T) zu bestimmen, und mittels der Abtrennvorrichtung (14a₁, 14a₂, 14a₃) die Schaberklinge (T), die herausgezogen worden ist, auf die erwünschte Abtrennlänge abgetrennt wird.

Revendications

1. Equipement de manipulation de lames de racloir pour une machine à papier/carton, lequel racloir ((T) sera placé contre la face d'un rouleau dans une machine à papier/carton de manière à maintenir ladite face propre et à entretenir ladite face, dans lequel une pièce brute de lame de racloir (T) est prise d'un rouleau de lame de racloir (10a₁, 10a₂, 10a₃,...), c'est-à-dire d'une bobine, et que l'équipement comprend un dispositif de coupe (14a₁, 14a₂,...) en vue de couper le matériau de la lame de racloir à la longueur d'extraction nécessaire ou de la lame, **caractérisé en ce que** l'équipement comprend un dispositif de mesure (13), et la longueur d'extraction peut être lue sur la base des informations transférées par le détecteur de mesure (13a₁, 13a₂, 13a₃,...) dudit dispositif de mesure (13) à l'unité centrale (100) afin de couper la longueur souhaitée d'une lame de racloir.
2. Equipement selon la revendication 1, **caractérisé en ce que** l'équipement comprend un affichage (16) relié à une unité centrale (100), depuis l'écran de visualisation de laquelle il est possible de lire la longueur extraite d'un rouleau de lame de racloir (10a₁, 10a₂, 10a₃, ...), sur la base des informations transmises par un détecteur de mesure (13a₁, 13a₂, 13a₃, ...) du dispositif de mesure (13), de manière à déterminer le point de coupe adéquat.
3. Equipement selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le détecteur de mesure (13a₁, 13a₂, 13a₃, ...) et le dispositif

de coupe (14a₁, 14a₂,...) sont placés dans le voisinage de l'ouverture de sortie de la lame (T) (A₁, A₂,...) de la station de rouleau de lames de racloir (D₁, D₂, D₃,...), et en ce que la pièce brute (T) des lames de racloir peut être contrôlée au moyen d'un guide (15a₁, 15a₂, 15a₃, ...) d'une manière contrôlée en sortant de la station de rouleau de lames de racloir (D₁, D₂, D₃,...).

4. Equipement selon l'une quelconque des revendications précédentes, **caractérisé en ce que** les rouleaux de lames de racloir (10a₁, 10a₂, 10a₃,...) ont été fixés sur leurs propres axes (11a₁, 11a₂, 11a₃), qui ont été montés au moyen de paliers (12a₁, 12a₂,...).
5. Equipement selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'unité centrale est reliée à un bus de transfert de données (e₁, e₂, e₃) passant à partir du détecteur de mesure (13a₁, 13a₂, 13a₃,...) du dispositif de mesure (13), et en ce qu'il y a un bus de transfert de données (e₄) depuis l'unité centrale (100) jusqu'à l'affichage (16).
6. Equipement selon l'une quelconque des revendications précédentes, **caractérisé en ce que** les rouleaux de lames de racloir (10a₁, 10a₂, 10a₃) dans chaque station de rouleau de lames de racloir (D₁, D₂, D₃) sont placés dans un chariot de stockage (50), lequel chariot de stockage (50) comprend des roues (50a₁, 50a₂, 50a₃, 50a₄) pour déplacer le chariot de stockage (50), auquel cas le chariot de stockage peut être déplacé facilement à l'emplacement souhaité en relation avec la machine à papier/carton.
7. Equipement selon la revendication 1, **caractérisé en ce que** l'équipement comprend, en outre, un dispositif de perforation (200) permettant la perforation de trous d'extraction à/aux extrémité/extrémités de la lame de racloir.
8. Procédé de manipulation de lames de racloir pour une machine à papier/carton, lesquelles lames de racloir sont prévues pour être utilisées en relation avec les rouleaux d'une machine à papier/carton pour l'entretien de leurs faces, dans lequel une pièce brute de lame de racloir est guidée depuis un rouleau de lame de racloir (10a₁, 10a₂, 10a₃,...) jusqu'à un dispositif de coupe (14a₁, 14a₂, 14a₃), **caractérisé en ce que** il y a un dispositif de mesure (13) et à l'intérieur de celui-ci un détecteur de mesure (13a₁, 13a₂, 13a₃), et la longueur de la lame de racloir extraite du rouleau de lames de racloir peut être basée sur les informations transmises par ledit détecteur afin de déterminer le point de coupe adéquat (T), et en ce

qu'au moyen du dispositif de coupe (14a₁, 14a₂, 14a₃), la lame de racloir (T) qui a été extraite est coupée à la longueur de coupe souhaitée.

5

10

15

20

25

30

35

40

45

50

55

6

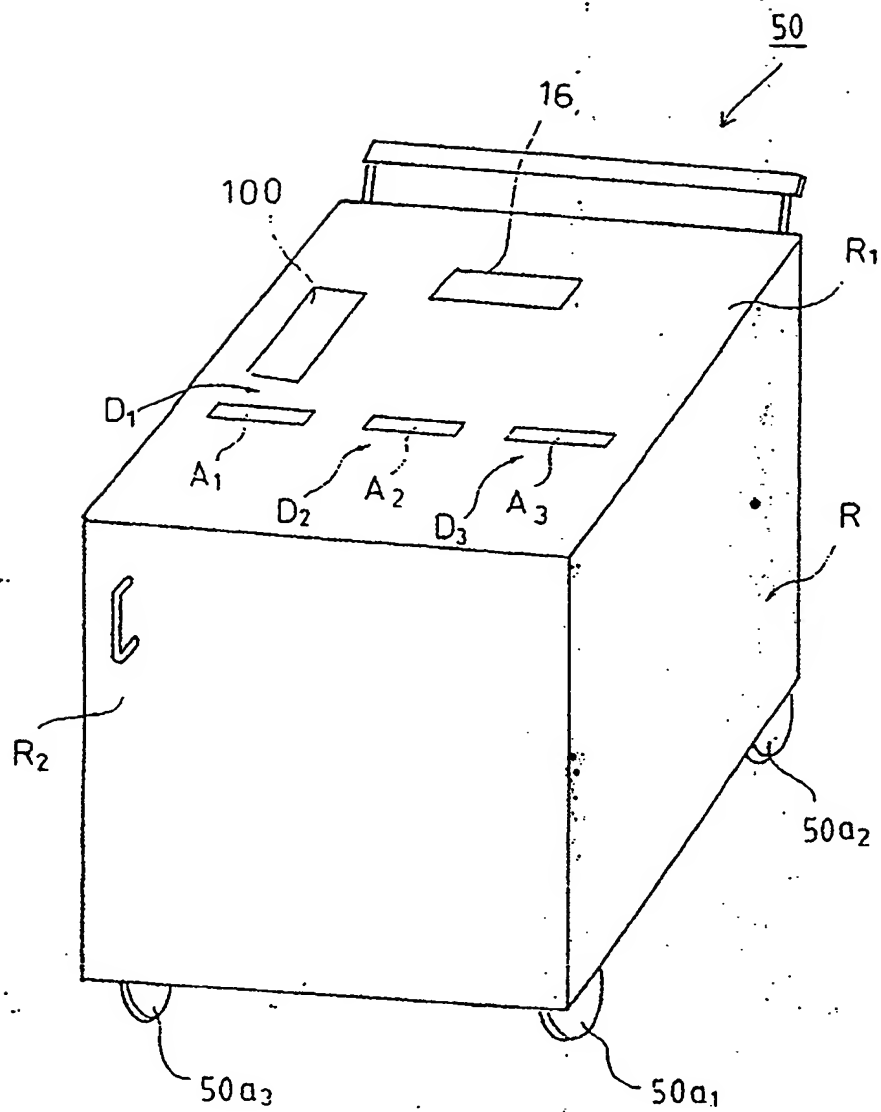


FIG. 1

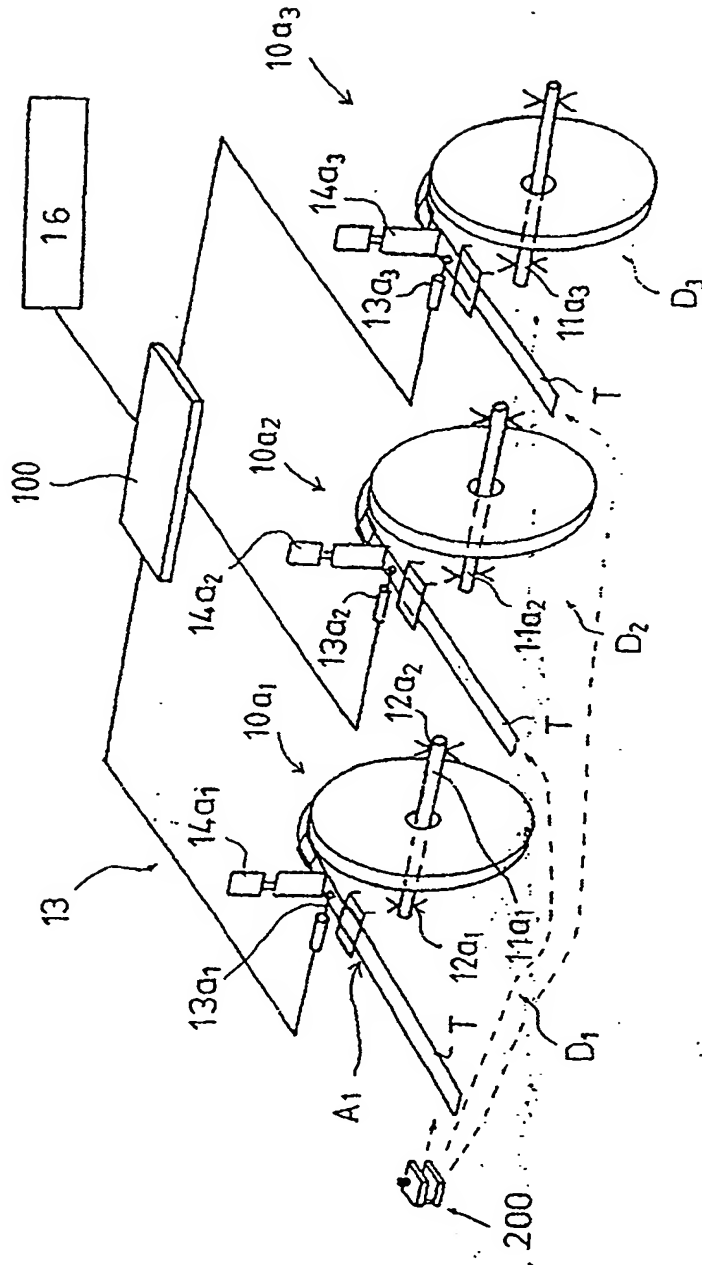


FIG. 2

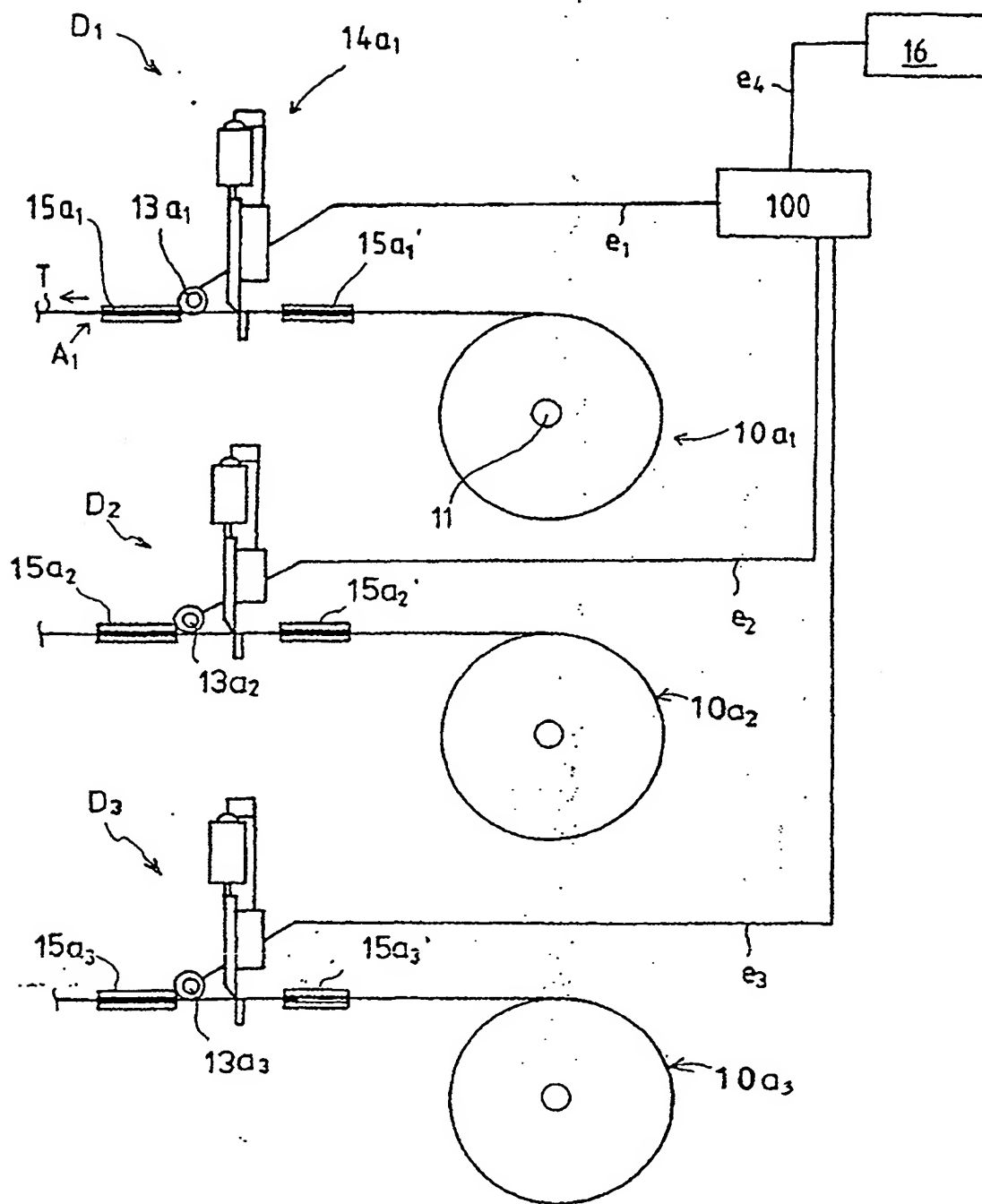


FIG. 3